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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,199	02/25/2004	Misty Azara	CQ10218	3364

23493 7590 12/07/2007  
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EXAMINER
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COLUCCI, MICHAEL C

ART UNIT	PAPER NUMBER
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2626

MAIL DATE	DELIVERY MODE
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12/07/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/785,199

**Applicant(s)**

AZARA ET AL.

**Examiner**

Michael C. Colucci

**Art Unit**

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/20/2006, 2/25/2004.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 4-13, 15-16, 18-27, and 29-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Olive et al, US 5790978 (herein after Olive) in view of Phillips et al US 6249761 B1 (hereinafter Phillips).

Re claims 1, 15, 29-30, Olive teaches a method of synthesizing speech using discourse function level prosodic features comprising the steps of:

determining output information (col 2 line 61 – col 3 line 8);

determining a model of discourse function level prosodic features (“enables the computation of a pitch contour which closely models a natural speech contour for a synthetic speech utterance”; col 4 line 45-50.) Prosodic features are construed as the pitch, stress, junctures, and/or voicing level attribute of text (sentences) or segments of

text. Olive teaches synthesized speech synthesis where pauses, inflections, accentuation and syllabic stress are taken into account.);

determining adjusted synthesized speech output based on the discourse functions and the model of discourse function level prosodic features ("enables the computation of a pitch contour which closely models a natural speech contour for a synthetic speech utterance"; col 4 line 45-50).

However, Olive fails to teach, but Phillips teaches determining a theory of discourse analysis from a plurality of theories of discourse analysis based on the speech to be synthesized ("A language model consists of, for example, one or more models of context dependent units having probability distributions associated therewith, models that map context dependent units to words, and models that map words to sentences"; Phillips col 1 line 43-61);

determining discourse functions in the output information the discourse functions being determined based on a mapping between basic discourse constituents of the determined theory of discourse analysis and a plurality of discourse functions ("A language model consists of, for example, one or more models of context dependent units having probability distributions associated therewith, models that map context dependent units to words, and models that map words to sentences"; Phillips col 1 line 43-61);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention determining a theory of discourse analysis from a plurality of theories based on speech to be synthesized. Using various models allows for a broader

range for recognizing features within input text, where probability models, context dependency models, and language models would allow for a more adjusted accurate synthesis of speech.

It would also have been obvious to one of ordinary skill in the art at the time of the invention determining discourse functions based on mapping between discourse constituents and discourse functions. Various models allows for a broader range for recognizing features within input text, where probability models, context dependency models, and language models would allow for a more adjusted accurate synthesis of speech, where reduction of error would occur by checking the context and probability information of a sentence rather than just the portion of the sentence being considered.

Re claims 2 and 16, Olive teaches the method of claim 1, wherein the discourse functions are determined based on a theory of discourse analysis (Fig. 5 items 10 and 11).

Re claims 4 and 18, Olive teaches the method of claim 1, wherein the output information is at least one of text information and application output information (col 2 line 61 – col 3 line 8).

Re claims 5 and 19, Olive teaches the method of claim 1, wherein determining the adjusted synthesized speech output further comprises the steps of:

determining a synthesized speech output based on the output information (col 2 line 61 – col 3 line 8);

determining discourse function level prosodic feature adjustments (“enables the computation of a pitch contour which closely models a natural speech contour for a synthetic speech utterance”; col 4 line 45-50. Prosodic features are construed as the pitch, stress, junctures, and/or voicing level attribute of text (sentences) or segments of text. Olive teaches synthesized speech synthesis where pauses, inflections, accentuation and syllabic stress are taken into account);

determining adjusted synthesized speech output based on the synthesized speech output and the discourse level prosodic feature adjustments (“enables the computation of a pitch contour which closely models a natural speech contour for a synthetic speech utterance”; col 4 line 45-50).

Re claims 6 and 20, Olive teaches the method of claim 1, wherein the model of discourse function level prosodic features is a predictive model of discourse functions (“a pitch contour can be predicted that closely models a natural speech contour for a synthetic speech utterance by adding the individual contours of the different intonational classes”; (Col. 1 line 59-64).

Re claims 7 and 21, Olive teaches the method of claim 6, in which the predictive models are determined based on at least one of: machine learning and rules (“input to this process will be the phonemes within the accent group under consideration (the text

comprising each such accent group being determined in accordance with the rule of Mobius defined above, or variants of such a rule)”; Col. 4 line 51-59).

Re claims 8 and 22, Olive teaches the method of claim 1, in which the prosodic features occur in at least one of a location: preceding, within and following the associated discourse function (“a perturbation to the natural pitch curve where a consonant precedes a vowel is an obstruent... Then when an obstruent is encountered in an accent group, the perturbation parameter for that obstruent is obtained from the table”; Col. 7 line 5-20).

Re claims 9 and 23, Olive teaches the method of claim 1, in which the prosodic features are encoded within a prosodic feature vector (“the perturbation parameter for each obstruent consonant is determined from natural speech data and that set of parameters stored in a look-up table.”; Col. 7 line 5-20. A vector is construed as a data structure, where text is construed as a *vector* type.).

Re claims 10 and 24, Olive teaches the method of claim 9, in which the prosodic feature vector is a multimodal feature vector (Olive teaches features of synthesized speech to include human-like characteristics such as pauses, inflections, accentuation, and symbolic stress; Col. 1 line 9-25).

Re claims 11 and 25, Olive teaches the method of claim 1, in which the discourse function is an intra-sentential discourse function ("division of the input text into reasonable chunks for further processing, such chunks usually corresponding to sentences. Then these chunks will be further broken down into tokens, which normally correspond to words in a sentence constituting a particular chunk. Further text processing includes the identification of phonemes for the tokens being synthesized, determination of the stress to be placed on various syllables and words comprising the text, and determining the location of phrase boundaries for the text and the duration of each phoneme in the synthesized speech."; Col. 3 line 22-45).

Re claims 12 and 26, Olive teaches the method of claim 1, in which the discourse function is an inter-sentential discourse function ("division of the input text into reasonable chunks for further processing, such chunks usually corresponding to sentences. Then these chunks will be further broken down into tokens, which normally correspond to words in a sentence constituting a particular chunk. Further text processing includes the identification of phonemes for the tokens being synthesized, determination of the stress to be placed on various syllables and words comprising the text, and determining the location of phrase boundaries for the text and the duration of each phoneme in the synthesized speech."; Col. 3 line 22-45).

Re claims 13 and 27, Olive teaches a method of synthesizing speech using discourse function level prosodic features comprising the steps of:



determining output information (col 2 line 61 – col 3 line 8);

determining a model of discourse function level prosodic features (“enables the computation of a pitch contour which closely models a natural speech contour for a synthetic speech utterance”; col 4 line 45-50. Prosodic features are construed as the pitch, stress, junctures, and/or voicing level attribute of text (sentences) or segments of text. Olive teaches synthesized speech synthesis where pauses, inflections, accentuation and syllabic stress are taken into account.);

determining adjusted synthesized speech output based on the discourse functions and the model of discourse function level prosodic features (“enables the computation of a pitch contour which closely models a natural speech contour for a synthetic speech utterance”; col 4 line 45-50).

However, Olive fails to teach, but Phillips teaches determining discourse functions in the output information based on a contextually aware theory of discourse analysis using a mapping between basic discourse constituents of the contextually aware theory of discourse analysis and a plurality of discourse functions (“A language model consists of, for example, one or more models of context dependent units having probability distributions associated therewith, models that map context dependent units to words, and models that map words to sentences”; Phillips col 1 line 43-61);

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention determining discourse functions based on a contextually aware theory of discourse, mapping between discourse constituents and discourse functions. A context dependent model as well as various models allows for a broader range for

recognizing features within input text, where probability models, context dependency models, and language models would allow for a more adjusted accurate synthesis of speech, where reduction of error would occur by checking the context of a sentence rather than just the portion of the sentence being considered.

**4. Claims 3 and 17 rejected under 35 U.S.C. 103(a) as being unpatentable over Olive et al, US 5790978 (herein after Olive) in view of Phillips et al US 6249761 B1 (hereinafter Phillips) and further in view of Polanyi et al US PGPUB 20020083104 (herein after Polanyi).**

Re claims 3 and 17, Olive in view of Phillips fails to teach, but Polanyi teaches the method of claim 2, in which the theory of discourse analysis is at least one of: the Linguistic Discourse Model, the Unified Linguistic Discourse Model, Rhetorical Structures Theory, Discourse Structure Theory and Structured Discourse Representation Theory ("analyzing the texts using a theory of discourse analysis, such as the Linguistic Discourse Model, Rhetorical Structures Theory or any other known or later-developed theory of discourse analysis"; Polanyi [0054]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention using the Linguistic Discourse Model. Linguistic models such as the Linguistic Discourse Model would allow for the identification of errors or flaws within a text document by comparison through linguistic data within the model (i.e. parts of speech tagging, parsing, sequence of sentence/word analysis).

**5. Claims 14 and 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Olive et al, US 5790978 (herein after Olive) in view of Phillips et al US 6249761 B1 (hereinafter Phillips) and further in view of Reed US 5095432 (hereinafter Reed).**

Re claims 14 and 28, Olive in view of Phillips fails to teach, but Reed teaches the method of claim 13, in which the context is at least one of: semantic, pragmatic, and syntactic context ("NLP generally consists of multiple levels of analysis, including lexical (word-level), syntactic (parsing), semantic (meaning), and pragmatic (context and common sense), and it is not clear how to integrate these levels of analysis into a complete system"; Reed col 1 line 22-34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention using syntactic, semantic, or pragmatic context. The integration of various types of context allow for a complete system. Without syntactic analysis parsing would not be efficient and without semantic and pragmatic analysis, an increased chance of error would be present, where a one dimensional approach on the meaning of a word is taking by neglecting surrounding text.

### ***Conclusion***

**6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5390278 A, US 5930788 A, US 6374212 B1.**

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Colucci whose telephone number is (571)-270-1847. The examiner can normally be reached on 9:30 am - 6:00 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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